Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.   (previously presented)   A multiparameter high precision concurrent estimation method in image subpixel matching in which in an N-dimensional similarity space where N (N is an integer of four or greater) correspondence parameters between images are axes, said N correspondence parameters between images are estimated concurrently by using an N-dimensional similarity value between images obtained at discrete positions, comprising the steps of:

determining a sub-sampling position where said N-dimensional similarity value between images is maximum or minimum on a line in parallel with a certain parameter axis, and determining an N-dimensional hyperplane that most approximates determined said sub-sampling position;

determining N of said N-dimensional hyperplanes with respect to each parameter axis;

determining an intersection point of N of said N-dimensional hyperplanes; and

setting said intersection point as a sub-sampling grid estimation position for said correspondence parameter between images that gives a maximum value or a minimum value of N-dimensional similarity in said N-dimensional similarity space; and

displaying an image deformed by said N correspondence parameters between images that were estimated.

2.   (previously presented)   A three-parameter high precision concurrent estimation method in image subpixel matching in which in a three-dimensional similarity space where three correspondence parameters between images are axes, said three correspondence parameters between images are estimated concurrently by using a

three-dimensional similarity value between images obtained at discrete positions, comprising the steps of:

determining a sub-sampling position where said three-dimensional similarity value between images is maximum or minimum on a line in parallel with a certain parameter axis, and determining a plane that most approximates determined said sub-sampling position;

determining three of said planes with respect to each parameter axis;

determining an intersection point of three of said planes; and

setting said intersection point as a sub-sampling grid estimation position for said correspondence parameter between images that gives a maximum value or a minimum value of three-dimensional similarity in said three-dimensional similarity space; and

displaying an image deformed by said three correspondence parameters between images that were estimated.

3.   (previously presented)   A two-parameter high precision concurrent estimation method in image subpixel matching in which displacements between images in horizontal and vertical directions that give a maximum value or a minimum value of a two-dimensional similarity in a continuous area is are estimated by using a two-dimensional similarity value between images obtained discretely, comprising the steps of:

determining a sub-sampling position where said two-dimensional similarity value between images is maximum or minimum on a line in parallel with a horizontal axis, and determining a line (horizontal extreme value line HEL) that most approximates determined said sub-sampling position;

determining a sub-sampling position where said two-dimensional similarity value between images is maximum or minimum on a line in parallel with a vertical axis, and determining a line (vertical extreme value line VEL) that most approximates determined said sub-sampling position;

determining an intersection point of said horizontal extreme value line HEL and said vertical extreme value line VEL; and

setting said intersection point as a subpixel estimation position for said displacements between images in horizontal and vertical directions that gives a maximum value or a minimum value of said two-dimensional similarity; and

displaying an image deformed by said displacements between images in horizontal and vertical directions that were estimated.

4. - 6. (canceled)

7.   (previously presented)   A multiparameter high precision concurrent estimation method in image subpixel matching in which in an N-dimensional similarity space where N (N is an integer of four or greater) correspondence parameters between images are axes, said N correspondence parameters between images are estimated concurrently by using an N-dimensional similarity value between images obtained at discrete positions, comprising the steps of:

determining a sub-sampling position where said N-dimensional similarity value between images is maximum or minimum on a line in parallel with a certain parameter axis, and determining an N-dimensional hyperplane that most approximates determined said sub-sampling position;

determining N of said N-dimensional hyperplanes with respect to each parameter axis;

determining an intersection point of N of said N-dimensional hyperplanes;

setting said intersection point as a sub-sampling grid estimation position for said correspondence parameter between images that gives a maximum value or a minimum value of N-dimensional similarity in said N-dimensional similarity space; and

displaying said N correspondence parameters between images that were estimated with numerical value.

8.   (previously presented)   A three-parameter high precision concurrent estimation method in image subpixel matching in which in a three-dimensional similarity space where three correspondence parameters between images are axes, said three

correspondence parameters between images are estimated concurrently by using a three-dimensional similarity value between images obtained at discrete positions, comprising the steps of:

determining a sub-sampling position where said three-dimensional similarity value between images is maximum or minimum on a line in parallel with a certain parameter axis, and determining a plane that most approximates determined said sub-sampling position;

determining three of said planes with respect to each parameter axis;

determining an intersection point of three of said planes;

setting said intersection point as a sub-sampling grid estimation position for said correspondence parameter between images that gives a maximum value or a minimum value of three-dimensional similarity in said three-dimensional similarity space; and

displaying said three correspondence parameters between images that were estimated with numerical value.

9.   (previously presented)   A two-parameter high precision concurrent estimation method in image subpixel matching in which displacements between images in horizontal and vertical directions that give a maximum value or a minimum value of a two-dimensional similarity in a continuous area are estimated by using a two-dimensional similarity value between images obtained discretely, comprising the steps of:

determining a sub-sampling position where said two-dimensional similarity value between images is maximum or minimum on a line in parallel with a horizontal axis, and determining a line (horizontal extreme value line HEL) that most approximates determined said sub-sampling position;

determining a sub-sampling position where said two-dimensional similarity value between images is maximum or minimum on a line in parallel with a vertical axis, and determining a line (vertical extreme value line VEL) that most approximates determined said sub-sampling position;

determining an intersection point of said horizontal extreme value line HEL and said vertical extreme value line VEL; and

setting said intersection point as a subpixel estimation position for said displacements between images in horizontal and vertical directions that give a maximum value or a minimum value of said two-dimensional similarity; and

displaying said displacements between images in horizontal and vertical directions that were estimated with numerical value.

10. - 12.   (canceled)